REMARKS

REJECTIONS UNDER 35 USC § 102

Claim 1 is rejected under 35 USC § 102(b) as being anticipated by Klainer et al. (US 5,026,139). It is the Examiner's position that Klainer discloses a method for real time determination of emulsion in a formation fluid comprising positioning an optical probe having a probe surface (fig. 2), which can measure changes in total internal light reflectance (column 1, lines 11-20 and 58-68), such that the probe surface is in contact with a formation fluid (column 2, lines 4-18), wherein the probe and its surface are composed of material which can withstand an extended period in contact with the formation fluid (fig. 4; in this case they show repeated measurements over a period of 20 minutes), measuring the total internal light reflectance at the probe surface, and determining in real time therefrom whether an emulsion is present or the degree of emulsification at such surface (fig. 3, column 2, lines 9-12).

It is the Applicants' position that contacting a probe with a formation fluid is not disclosed or implied in Klainer. There is no reference in Klainer that teaches using the Klainer probes with a reservoir fluid. Indeed, in Klainer, the reference refers to "medium" such the passage: "The change in refractive index of the medium (liquid or vapor or water emulsion) surrounding the fiber changes the transmission characteristics which results in a signal change at the detector." which is found at column 2, lines 9-12.

There mediums taught by the Klainer reference are also neither as complex or potentially problematic as the production fluids of the present invention which are defined in paragraph 0002 as fluids that are typically first recovered from a wellbore in oilfield recovery operations and generally consist primarily of crude oil and water and may also contain a number of additional components, such as water insoluble materials in the form of colloidal suspensions, but these are generally very minor components. Crude oil is, in itself a very complex mixture of organic compounds and may also include corrosive inorganic compounds as well.

Claims 1 reads:

> A method for real time determination of emulsion **in a formation fluid** comprising: (a) positioning an optical probe, having a probe surface which can measure changes in total internal light reflectance, **such that the probe surface is in contact with a formation fluid**, wherein the probe and its surface are composed of material which can withstand an extended period in contact with the formation fluid; (b) measuring the total internal light reflectance at the probe surface; and (c) determining in real time therefrom whether an emulsion is present or the degree of emulsification at such surface. (Emphasis added.)

The important element of contacting the probe with the formation fluid is missing in the teachings of Klainer. Since an element of Claim 1 is missing from Klainer, Klainer cannot anticipate Claim 1. Claim 1 is not anticipated under 35 U.S.C §102 under Klainer.

Claims 1-8, 10-11, 13, 15-16, 18 and 20 are rejected under 35 USC § 102(e) as being anticipated by Means (US Pub 2003/0051602). It is the Examiner's position that Means discloses a method for real time determination of an emulsion in a formation fluid comprising positioning an optical probe having a probe surface, which can measure changes in total internal light reflectance, such that the probe surface is in contact with a formation fluid, wherein the probe and its surface are composed of material which can withstand an extended period in contact with the formation fluid, measuring the total internal light reflectance at the probe surface, and determining in real time therefrom whether an emulsion is present or the degree of emulsification at such surface.

Since Means is commonly owned with the present invention, the Applicants cannot but agree with **MOST** of the Examiner's position. It is true that Means teaches contacting a probe with a production fluid, but the production fluid composition and the parameters of interest in Means are quite different from those of the present application. In Means, the parameter of interest is gas carry-over. Gas carry over results from gas bubbles in the oil (also referred to as emulsions or foams) (Means, paragraph 0007). The production fluid that is being tested in Means is being monitored for foaming. This is quite different from the present invention which is limited to water and oil emulsions.

Evidence of the limitation of the present invention to water and oil emulsions rather than to foaming can be found in the specification. "Any change indicates an increase or decrease in

the amount of total emulsion and/or degree of emulsification (that is, the relative proportions of the oil and water phases present in the emulsion), depending upon how the probes are set up." (The present application at paragraph 14). Further evidence can also be seen in the points at which the two inventions are practiced. In Means, the invention is practiced at a gas separator. In the present application, the invention is practiced at a water knock-out pot or a pipeline.

Stated another way, **the Means reference lacks the element of determining whether an emulsion (of water and oil) is present or the degree of its presence.** Instead, the Means reference teaches determining the presence of a foam (gas and water or oil emulsion). Since the Means reference lacks an important element of the all of the claims of the present invention, the claims of the present invention cannot be anticipated by Means. The claims of the present invention art not anticipated by Means.

REJECTIONS UNDER 35 USC § 103

Claim 5 is rejected under 35 USC § 103(a) as being unpatentable over Klainer et al. It is the Examiner's position that Klainer discloses a method for real time determination of emulsion in a formulation fluid. The Examiner acknowledges that It is not disclosed that the fluid is in a pipeline or in a free water knockout, but goes on to state that Klainer is generally directed to the probe, not to the container holding the fluid, and it would be obvious to place this probe anywhere to make a real time determination of emulsion in a formulation.

One of ordinary skill in the art would not have been motivated to employ the Klainer invention in solving the problems solved in the present application because there is no teaching or suggestions to do so. Klainer does not teach that changes in emulsion levels in these vessels is a problem. Klainer does not teach that its probes could be used to determine emulsion levels in a formation fluid which is far more complex than any of the materials taught in the Klainer reference. It follows then that Klainer does not teach the solution to the problem of using an optical probe to determine the presence or extent of an emulsion in a formation fluid to solve the problems of changes of emulsion levels in a knockout pot or pipeline. Neither Claim 5 nor any of the claims of the present application are obvious over Klainer.

Claim 12 is rejected under 35 USC § 103(a) as being unpatentable over Means. It is the Examiner's position that though Means does not disclose that the demulsification additive is an alkyl phenol resin, this type of resin is very well known in the art, and it would be obvious to one of ordinary skill in the art at the time the invention was made to use these resins as the demulsification additive in order to control emulsion formation.

It is the Applicants' position that neither Claim 12 nor any of the other claims of the present application are obvious over Means. Means teaches using an optical probe to detect the present or absence of foam. Foam can be described as an emulsion, but an emulsion of gas and liquid. The contrast between these two phases, form the perspective of refactive index, can be vast and comparatively easy to detect in comparison to a water and oil emulsion. Assuming that all other aspects of the present invention were included in Means, the claims of the present invention are not obvious because one of ordinary skill in the art could not conclude that the much more subtle emulsion of two immiscible liquids could be determined with sufficient resolution to serve a solution to the problem of determining presence and extent of a water and crude oil emulsion.

CLAIM OBJECTIONS

Claim 18 is objected to because it is identical to claim 15. Claim 15 has been amended to correct an error independency and this issue is believed moot.

CONCLUSION

For all the foregoing reasons, Applicant submits that the application is in a condition for allowance. No fee is believed due for this paper. The Commissioner is hereby authorized to charge any additional fees or credit any overpayment to Deposit Account No. **02-0429 (194-28885-US).**

Respectfully submitted,

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I hereby certify that this paper, along with any referred to as being attached or enclosed, is being mailed to the Attention: MS: Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, via the United States Postal Service, First Class Mail, postage prepaid on this 12th day of November , 2004.

Beth Pearson-Naul